

I claim:

1. A semiconductor chip carrier comprising:
a primary substrate;
- 5 a metal heat sink plate having a first side and an opposing second side where
said primary substrate is attached to said first side; and
a supplemental substrate attached to said metal heat sink plate on said second
side.
- 10 2. A semiconductor chip carrier according to claim 1, wherein said
supplemental substrate is constructed from a material having substantially similar
coefficient of thermal expansion as said primary substrate.
3. A semiconductor chip carrier according to claim 1, wherein said
15 supplemental substrate is constructed from a same material as said primary substrate.
4. A semiconductor chip carrier according to claim 1, wherein said primary
substrate is constructed from a material selected from one of Bis-maleimide triazine epoxy,
FR4, polyimide, and polytetrafluoroethylene.
- 20 5. A semiconductor chip carrier according to claim 1, wherein said primary
substrate is a ball-grid array chip carrier.
6. A semiconductor chip carrier according to claim 1, wherein said metal heat
25 sink plate is a metal selected from one of Cu, Cu-W, Al and alloys thereof.
7. A semiconductor chip carrier according to claim 1, wherein said
supplemental substrate has a Cu-Ni finish layer.
- 30 8. A semiconductor chip carrier according to claim 1, wherein said
supplemental substrate has a cavity exposing a portion of said metal heat sink plate.
9. A semiconductor chip carrier comprising:
a primary substrate;

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a metal heat sink plate having a first side and an opposing second side where said primary substrate is attached to said first side; and

a supplemental substrate being attached to said second side of said metal heat sink plate, wherein said supplemental substrate is constructed from a material having a substantially similar coefficient of thermal expansion as said primary substrate.

10. A semiconductor chip carrier according to claim 9, wherein said supplemental substrate is constructed from a same material as said primary substrate.

10 11. A semiconductor chip carrier according to claim 9, wherein said primary substrate is constructed from a material selected from one of Bis-maleimide triazine epoxy, FR4, polyimide, and polytetrafluoroethylene.

12. A semiconductor chip carrier according to claim 9, wherein said chip carrier is a ball-grid array chip carrier.

13. A semiconductor chip carrier according to claim 9, wherein said metal heat sink plate consists of a metal selected from one of Cu, Cu-W, Al, and alloys thereof.

20 14. A semiconductor chip carrier according to claim 9, wherein said supplemental substrate has a Cu-Ni finish layer.

15. A semiconductor chip carrier according to claim 9, wherein said supplemental substrate has a cavity exposing a portion of said metal heat sink plate.

25 16. A method of forming a semiconductor chip carrier, comprising:
providing a metal heat sink plate having a first side and an opposing second side;

attaching a primary substrate to said first side; and
30 attaching a supplemental substrate to said second side of said metal heat sink plate, wherein said supplemental substrate is constructed from a material having substantially similar coefficient of thermal expansion as said primary substrate.

17. A process according to claim 16, wherein said supplemental substrate is
35 constructed from a same material as said primary substrate.

18. A process according to claim 16, wherein said primary substrate is constructed from a material selected from one of Bis-maleimide triazine epoxy, FR4, polyimide, and polytetrafluoroethylene.

5 19. A process according to claim 16, wherein said chip carrier is a ball-grid array chip carrier.

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